Analytical model of workpiece temperature in end milling in-situ TiB_2/7050Al metal matrix composites

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HIGHLIGHTS

- An attempt was made to establish a temperature model for predicting cutting temperature of a new kind of metal matrix composites (MMCs), whose analytical temperature models do not exist at present.
- The temperature model of workpiece, which was machined by the bottom cutting edge of a flat end mill in end milling process, was proposed.
- With validation, the temperature model proposed in this study was able to predict the temperature of workpiece surface machined by the bottom cutting edge during end milling process.
- The heat partition ratio B_s increased linearly as thermal number increased, which seems to be different from other researches.
- This analytical model will be of great significance for both the temperature modeling work of end milling process and analytical modeling study of machining particle reinforced aluminum metal matrix composites.